

# Insertion of User Content Into Passthrough Signal (One Broadcasting Channel, SDI Signal)



Customizing of Solution  
Based on Forward TA SDI

*Revision as of  
December 26, 2011*

Quick Start

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Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

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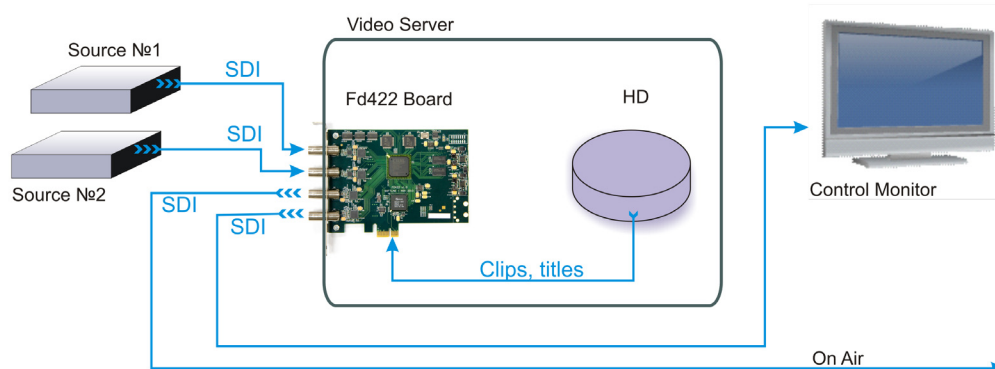


## Introduction

The document provides with instructions on customizing of a solution for insertion of user content (for example, advertisement) into a passthrough signal – 1 broadcasting channel, SDI signal (uncompressed digital video).

Such solutions require the Forward TA SDI product (or a product with a broader functions set). The solution is based on FD422 board.

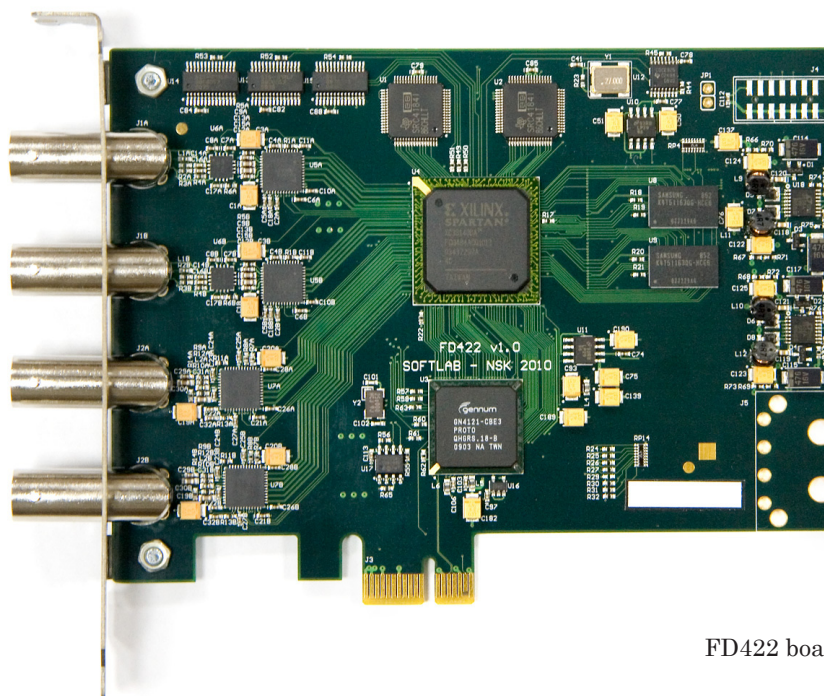
The board has 2 input and 2 output lines. In considering solution (see the picture below) all board inputs and outputs are prepared for working with SDI. Board input lines work independently, i.e. 2 independent sources of a passthrough video can be used in this solution. Signal with the same content is on both board output lines. The solution provides with a possibility to output on air a signal from one output and another signal on control monitor from another output.





## The FD422 Board Specification

The FD422 board (see picture below) is hardware part of a product set designed for organizing digital TV broadcasting. The FD422 board deals with SDI and/or ASI signals.



FD422 board

**Table 1.** The FD422 Board Specification

Bus	PCI Express 1x
Inputs	2 x BNC SDI/ASI
Outputs	2 x BNC SDI/ASI
Signal format	SDI 10-bit (SMPTE 259M) ASI (EN50083-9)
Internal video data processing	4:2:2 10-bit for input/output 4:2:2 8-bit for internal mixing
Supported video	720x576, 25 fr/sec PAL 720x486, 29.97 fr/sec NTSC
Audio	<ul style="list-style-type: none"><li>• Embedded audio (SMPTE272M-A)</li><li>• Genlock to any input</li><li>• Synchronizing audio to video signal</li></ul>



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## Customizing of Solution

This section provides with an advisable workflow of solution customizing. Pass to step 5 if the product was purchased as an assembled kit including video server with plugged board and necessary software.

1. Switch off PC. Plug the FD422 board to PCI Express mother board slot.

✓ **Important:** Power down PC before plugging the board. Disconnect EPU and pull out a cable from 220 V socket.

2. Turn on PC. Refuse installing drivers for new hardware if a corresponding message appears.  
The FD422 board drivers will be automatically installed later during installation of product software.
3. Activate product registration first by double-clicking name of REG file (registration key). All necessary information will be added into Windows Registry. Then reboot machine.

**Note:** Registration key is included into product delivery set. For the Forward TA SDI product REG file is a file with the `reg` extension that is located on setup disk in the **Registration** folder.

4. Install software in the following order (for more information on this issue see the [«Installation of ForwardT Software. User's Guide»](#)):
  1. Microsoft .Net Framework 3.5 SP1 (in case if this package is not installed on your PC).
  2. Microsoft DirectX Update (in case if this software is not installed on your PC).
  3. Software of purchased product.  
For this you should first start installation file: `ForwardTxSoftware_Setup_n_n_n.exe`, where `n_n_n` denotes number of version.  
Then follow Setup Wizard instruction.  
In the window where you have to select necessary components set only the Forward TA SDI check mark.  
Reboot PC after installation.

✓ **Important:** First plug FD422 into PC. Then install product software.

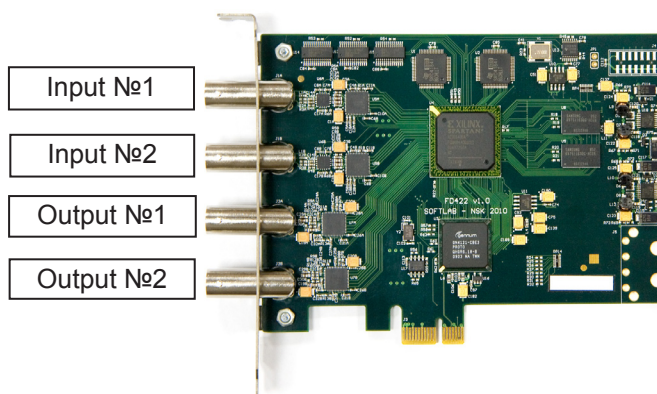


**Note:** All mentioned above files for software installation are located on setup disk. You may also download the files at the **Download** web page: <http://www.softlab-nsk.com/forward/download.html>

We recommend installing the latest available updates of software.

5. Plug to the board sources of signal, control monitor and device used for transmitting of a signal (if it is necessary).

The picture below shows purpose of FD422 connectors.



Purpose and numbers of FD422 board slots

6. Customize parameters of board using the FDConfig2 application. For more information on this issue see the «Customizing of Board Parameters» section.
7. You may control broadcasting either automatically or manually via the FDO nAir application. Customize the FDO nAir application for working with the FD422 board. Prepare broadcasting schedule. To insert your own content into a passthrough signal create a schedule with 2 types of blocks of commands:
  1. For broadcasting of a signal coming from the main broadcasting station. The blocks include commands to control passthrough video from board inputs: Video Input N (N is index from 1 – 6).
  2. For broadcasting of a signal coming from local station. If your own content is in the form of files and located on PC hard disk then the blocks will include commands for broadcasting of video from files (Play video clip).For more details on workflow, see the «Configuration and Control Over Broadcasting in FDO nAir» section.





## Customizing of Board Parameters

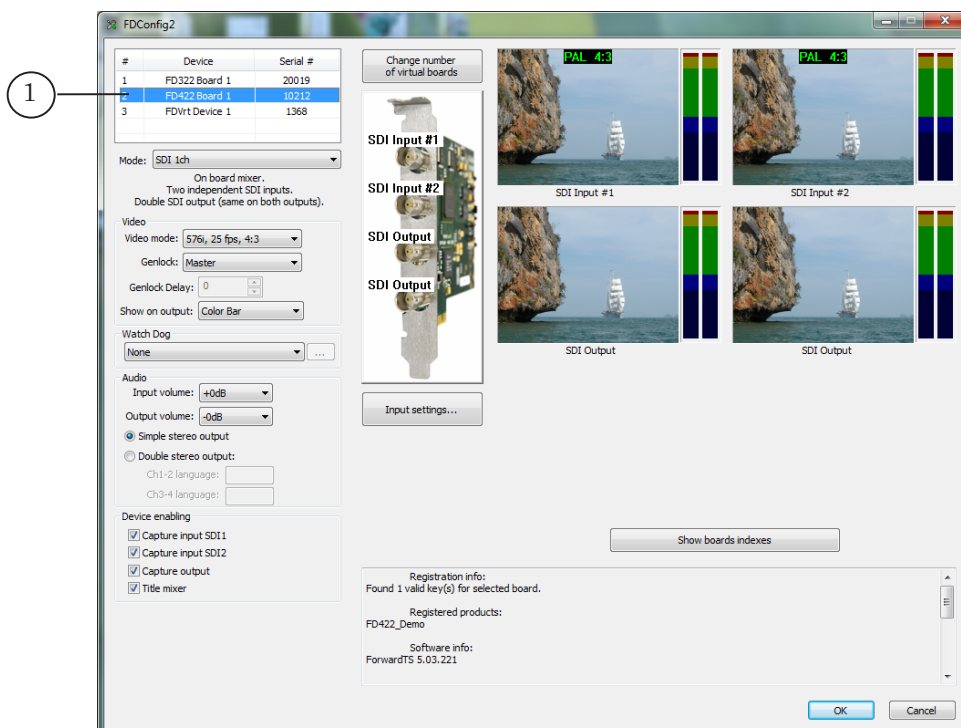
### Step 1. Launch of the FDConfig2 Application and Selection of Board

Configuration of the FD422 board is implemented via the FDConfig2 application. Application file is: ~\FDConfig2\FDConfig2.exe file, where ~ denotes a full path to the folder with ForwardT Software (if you install standardly C:\Program Files\ForwardT Software).

1. Open the Start menu to launch the FDConfig2 application: Programs > ForwardT Software > Board Setup > FDConfig2 or double-click application shortcut located on desktop:



- Note:**
1. The FDConfig2 application can be launched at any time. There is no any difference either any other applications that work with FD422 are launched or not.
  2. Close all applications that work with FD422 to apply any changes made during board configuration.
- 
2. Be sure that necessary board is selected in the device list (1).

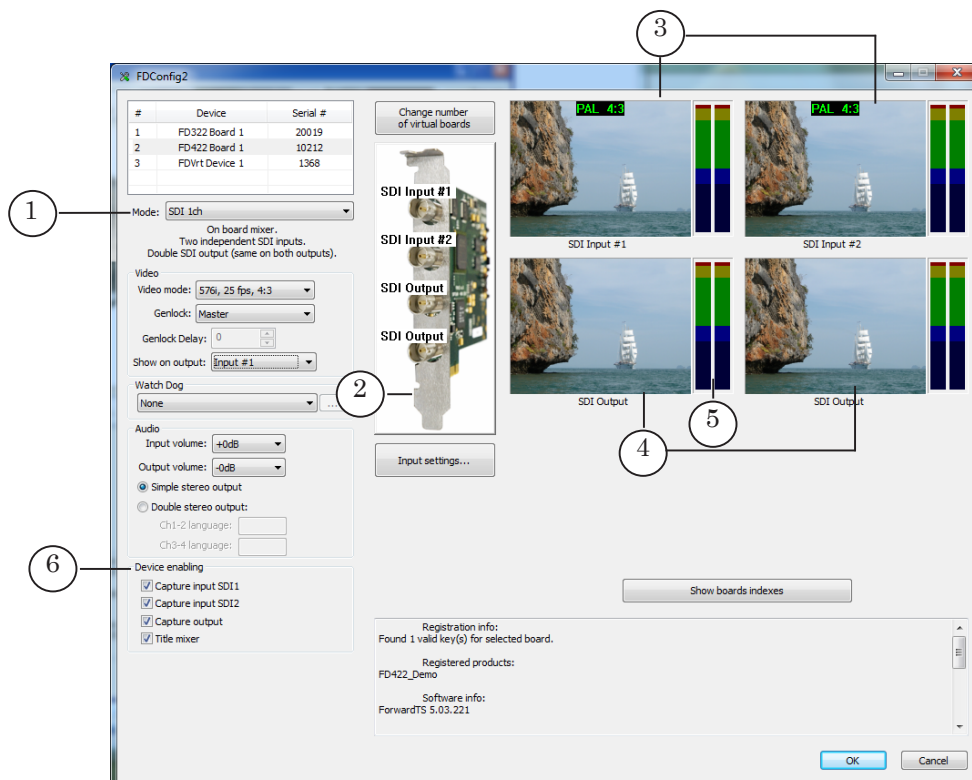






## Step 2. Selection of Board Mode and Activation of Functions

1. Select the SDI 1ch mode in the Mode drop-down list (1).  
The SDI 1ch mode sets the following configuration of board parameters:
  - 2 independent SDI inputs;
  - double SDI output (the same content on both outputs);
  - board mixer is on.



- Note:**
1. Information on current configuration is always displayed in application window (2).
  2. If some signal sources are plugged to board inputs preview windows display an image. Input lines (3) display different images, output lines (4) display the same images (for the SDI 1ch mode). Audiometers (5) display audio level in a signal of a corresponding line.
2. Be sure that all necessary check marks are put in the Device Enabling group (6).  
Put mark denotes enabling work of a corresponding function in applications that use FD422 (for more information see the table below).



**Table 2.** Functions of board available in the SDI 1 ch mode

Application	Functions (Name and Purpose)
	Capture from SDI Input 1/ Capture from SDI Input 2/ Capture from SDI Output
FDCapture	Capturing and recording of audio and video data into AVI files from input №1/input №2/output of board. Capturing is not available if the function is off.
SLStreamCapture	Capturing and recording in the WMV format of stream files from input №1/input №2/output of board. Capturing is not available if the function is off.
FDPreview	Previewing of data from input №1/input №2/output of board. Previewing is not available if the function is off.
Video2 title element	Playback of data from input №1/input №2/output of board in title element. Playback is not available if the function is off.
	Mixer
FDOnAir	The application will not work if the function is off.

**Note:** A possibility of using any of the functions depends on either you have or do not have a corresponding license. You have one licence if you purchased Forward TA SDI product:  
Capture from SDI Input 1, Capture from SDI Input 2,  
Capture from SDI Output, Mixer.

Information on licenses is kept in registration key and recorded into Windows Registry when the key is activated. If a system has several boards then a total number of corresponding licenses for corresponding products is taken into account.



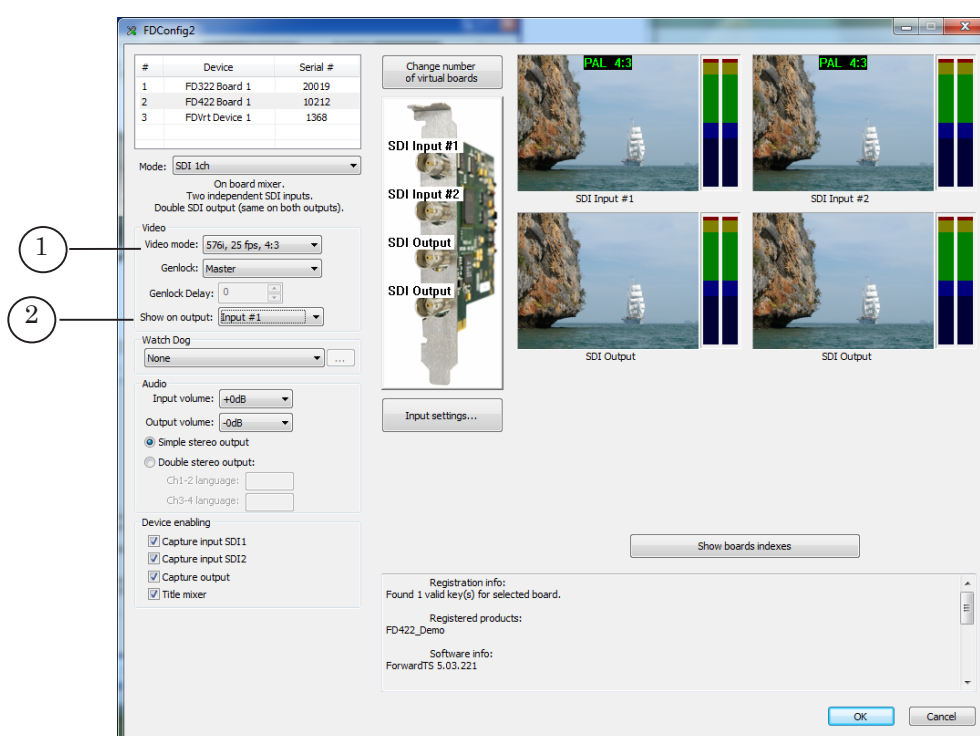
**Tip:** We recommend the following when working with the Device enabling group of elements:

1. Leave automatically put marks if there is one FD422 board in the system.
2. If there are several boards make sure that necessary check marks are put for corresponding boards. Automatically the marks can be distributed among boards in another way.
3. If there are several boards in the system you can manually redirect part of licences (accessible functions) of one board to another one by taking off and putting on check marks correspondingly.



### Step 3. Customizing of Video Mode

1. Select in the Video mode drop-down list (1) necessary format of video: vertical resolution, interlacing (progressive, interlaced), frame rate, aspect ratio.  
For example, 576i, 25 fr/sec, 4:3 corresponds to PAL standard.
2. Select in the Show on output drop-down list (2) what video data should be output by default: color bar, video from Input 1, video from Input 2. Selected item is active till another parameter is selected, for example, till the VideoInput N command (N is an index from 1 to 6) is activated in FDO nAir.





## Step 4. Customizing of Audio Mode

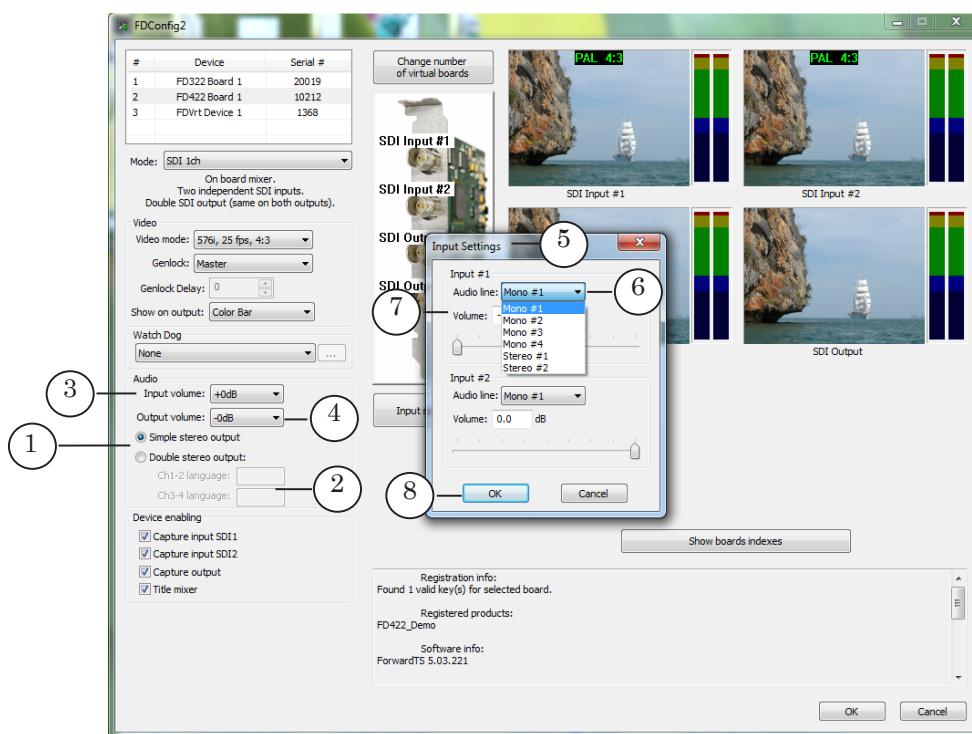
**Note:** The FD422 board can process up to 4 SDI audio channels: 4 mono channels or 2 stereo pairs.

1. Specify number of SDI audio lines in the Audio group of elements (1):

- Simple stereo output – one stereo pair;
- Double stereo output – two stereo pairs.

If you selected the Double stereo output mode then customize correspondance between channels numbers and SDI output lines by entering corresponding identifiers in text fields (2).

2. You may vary input volume by increasing/decreasing it in the Input volume field (3).
3. You may vary output volume by increasing/decreasing it in the Output volume field (4).



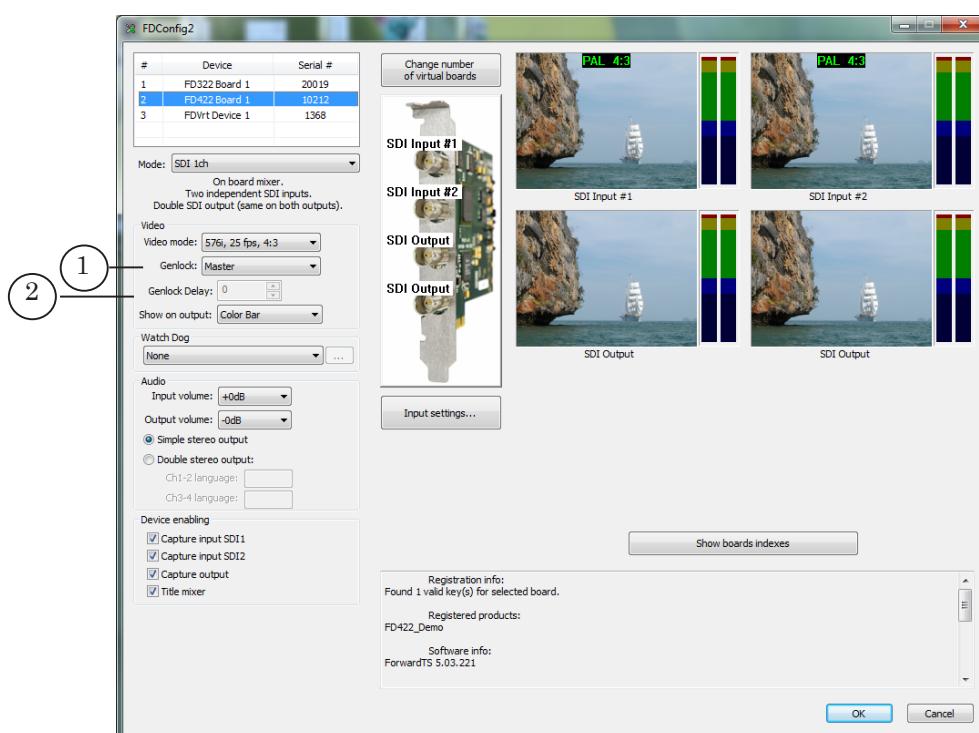
4. Click the Input Settings button and customize in the appeared window (5) each of the board inputs:

1. Specify (6) what audio line channel (channels) will be output during SDI signal broadcasting: mono channel, stereo channel or both stereo channels (only for the Double stereo output mode).
2. If necessary you can decrease audio line volume (7).
3. Click OK (8) to close the window.



## Step 5. Customizing of Genlock

1. Select genlock source in the Genlock drop-down list (1). Possible sources here are:
  - Master – internal board generator;
  - Input 1 – external source plugged to input 1;
  - Input 2 – external source plugged to input 2.
2. Specify if necessary in the Genlock Delay field (2) value of signal delay (selected experimentally). The field is available if external genlock source is used. Specified value compensates video signal delay that appears at passing of the signal by cable (default value is 0).



## Step 6. Customizing of Redundancy Mode

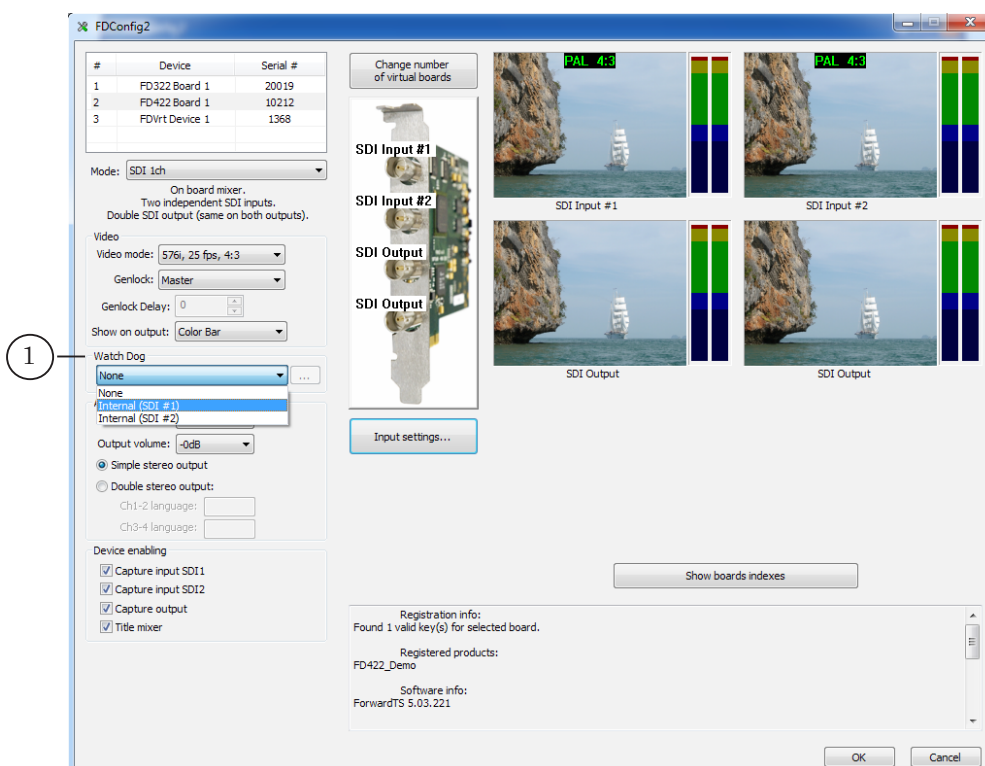
For organization of backup you may use the WatchDog function. There are 2 variants of realization of this function:

- Forward WatchDog Box (external device) – monitors current state of OS, board and used broadcasting application (FDOnAir/FDTimeShift). In case of air server failure it transmits to commutator signal to switch on a backup: passthrough video or reserve broadcasting server;
- integrated FD422 board function – allows monitoring current state of broadcasting application. In case of a failure (absence of response during some time (1 sec



by default)) reserve passthrough video from specified FD422 board input is automatically switched on.

1. If you work with the Forward WatchDog Box device select in the Watch Dog drop-down list (1) identifier of port to which the device is plugged (for more information on this issue see the «[Forward WatchDog Box. Device for Monitoring of Video Servers. User's Guide](#)»).
2. Select in the Watch Dog drop-down list (1) one of the variants of integrated board function to use it:
  - Internal (SDI №1) – in case of a failure broadcasting of passthrough video from input 1 is switched on;
  - Internal (SDI №2) – in case of a failure broadcasting of passthrough video from input 2 is switched on.

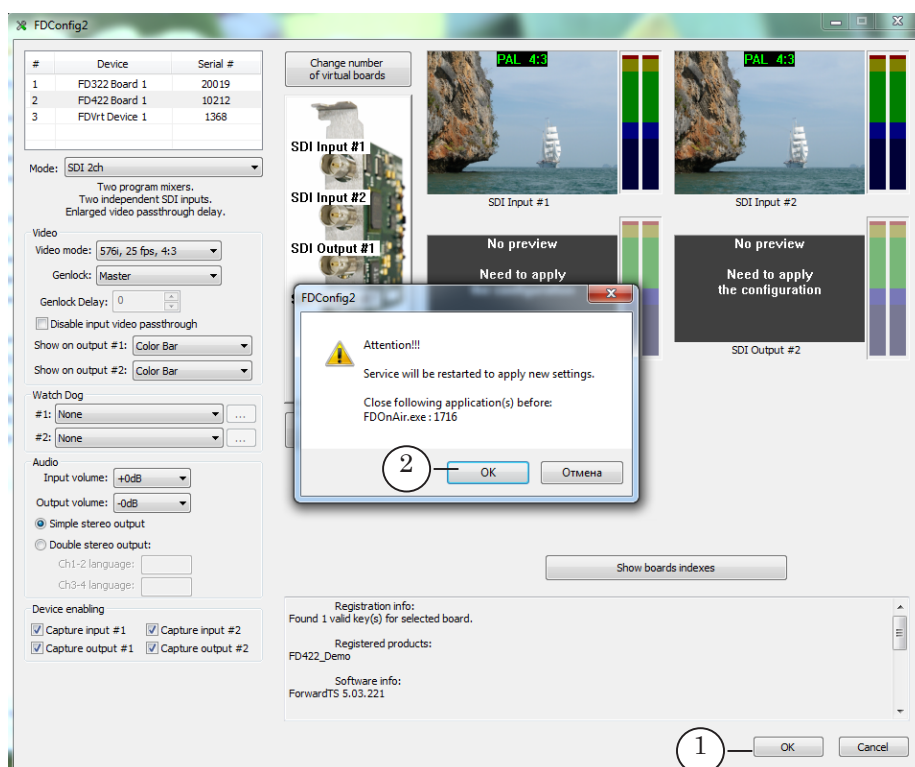




## Step 7. Applying of New Settings and Completion of Work with Applictaion

1. Close all applications that work with FD422.
2. Click OK (1) in the FDConfig2 application window.
3. Service message automatically appears. To apply new settings you need to restart board service.  
Click OK (2) in appeared window to allow restarting.

✓ **Important:** Close all applications that use FD422 to restart board service.



4. After this FDConfig2 application window will be closed, service will be automatically restarted and new settings will be activated.

✓ **Important:** New settings will be activated only after restarting of board service.





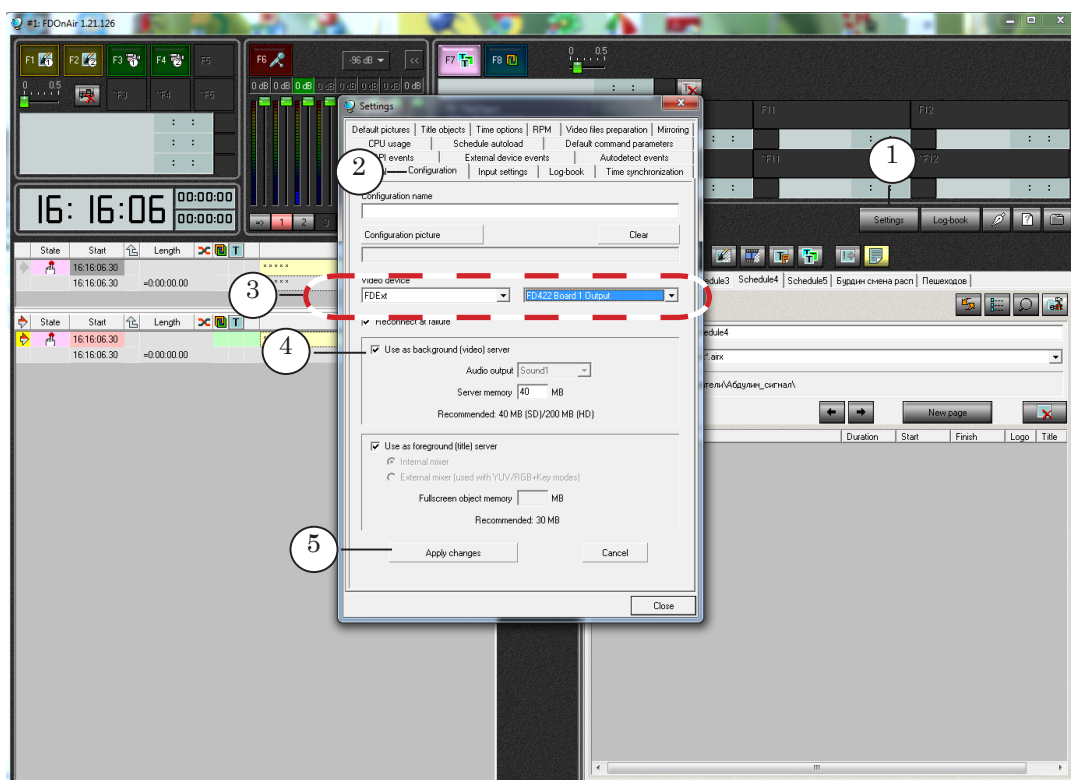
## Configuration and Control Over Broadcasting in FDO nAir

### Step 1. Launch and Configuration of Application

1. Launch the FDO nAir application via either the Start menu: Programs > ForwardT Software > OnAir or double-clicking application shortcut:



2. Click Settings in the main application window (1).



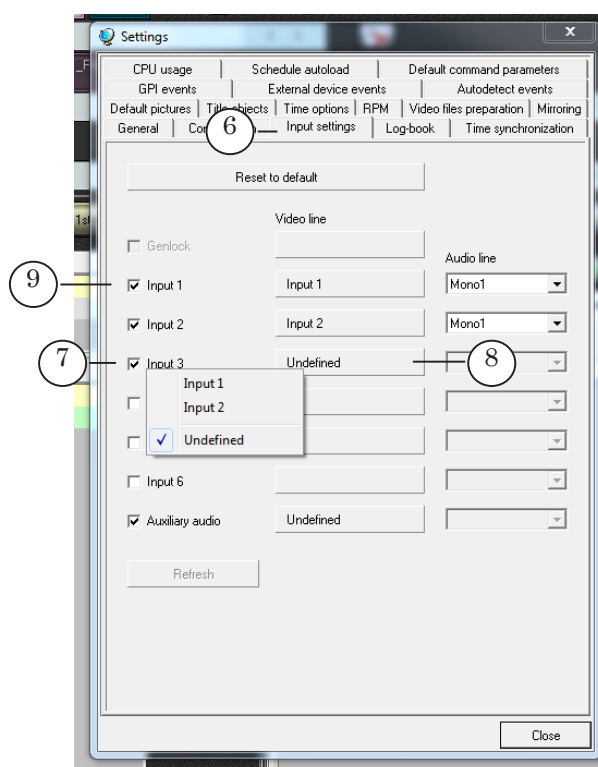
3. Pass to the Configuration tab (2) in the appeared window.
4. Select FDExt in the first list and FD422 Board N Output in the second list (3), N is a logic number of used board.
5. Be sure that the Use as background (video) server check mark (4) is put.
6. Click the Apply changes button (5).

✓ **Important** It is obligatory to click the Apply changes button to apply new settings.

7. Pass to the Input Settings tab (6).



**Note:** On the Input settings tab you may customize schedule commands – Video Input 1– Video Input 6 and buttons for interactive control located in the main application window (F3–F5, ^F3–^F5) of FDO nAir. The commands and the buttons are used to control broadcasting of passthrough video from inputs of used board. Specify corresponding board video line to customize the command.



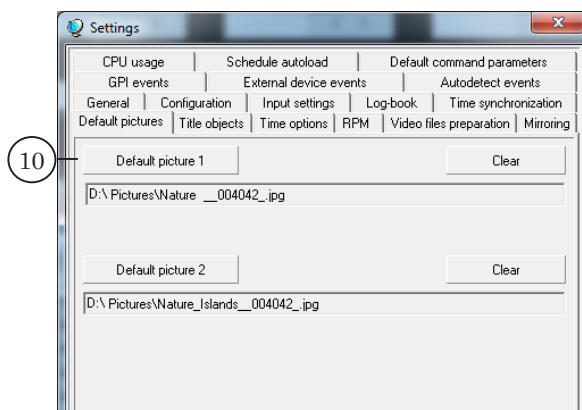
Customize consistently all necessary VideoInput N commands, N is index from 1 to 6.

Example: to customize the VideoInput 3 command:

1. Put the Input 3 check mark (7).
2. Click the VideoLine button (8) located in the same string.
3. In the drop-down list (9) select necessary video line to assign it to corresponding command. Possible variants here are:
  - Input 1 SDI – input №1 on used board;
  - Input 2 SDI – input №2 on used board.
8. Pass to the Default pictures tab (10).

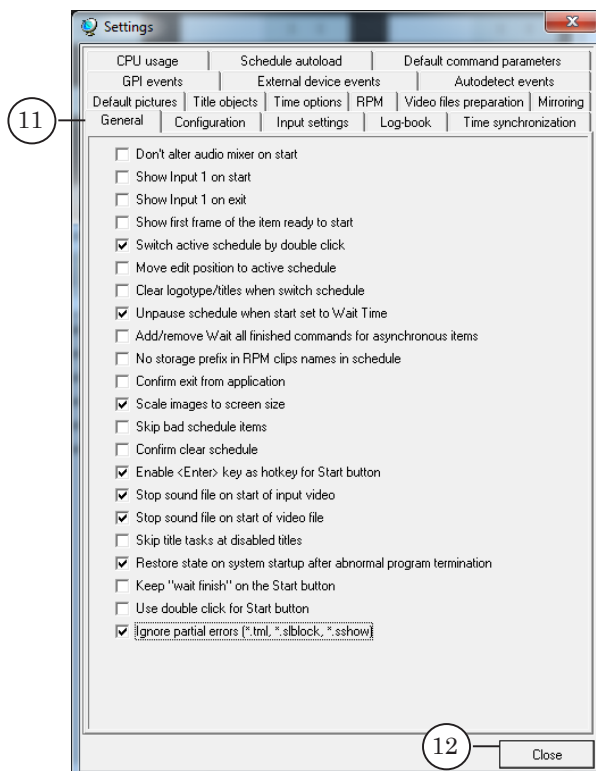


**Note:** The Default pictures tab is used for customizing of schedule commands – Default picture 1, Default picture 2 and assigned to them buttons of interactive control (F1, F2) located in FDO nAir main window. The commands are used to control default pictures – full-screen static images.



Customize Default picture 1 and Default picture 2 by specifying paths to graphic files with images.

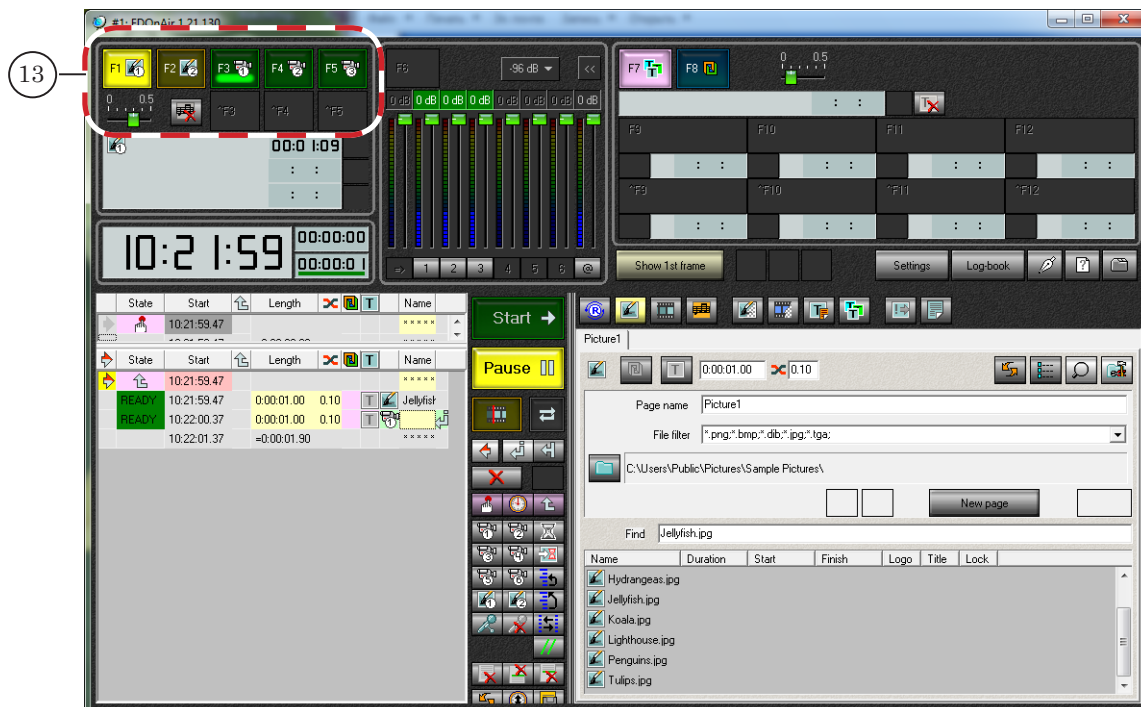
9. Pass to the General tab (11) to customize general parameters of FDO nAir. Be sure that check marks are put for all options necessary for working.



10. Click the Close button (12) to close the window after finishing configuration.



11. Only buttons for controlling default pictures and passthrough video (13) customized in the Settings window become active in the main application window.



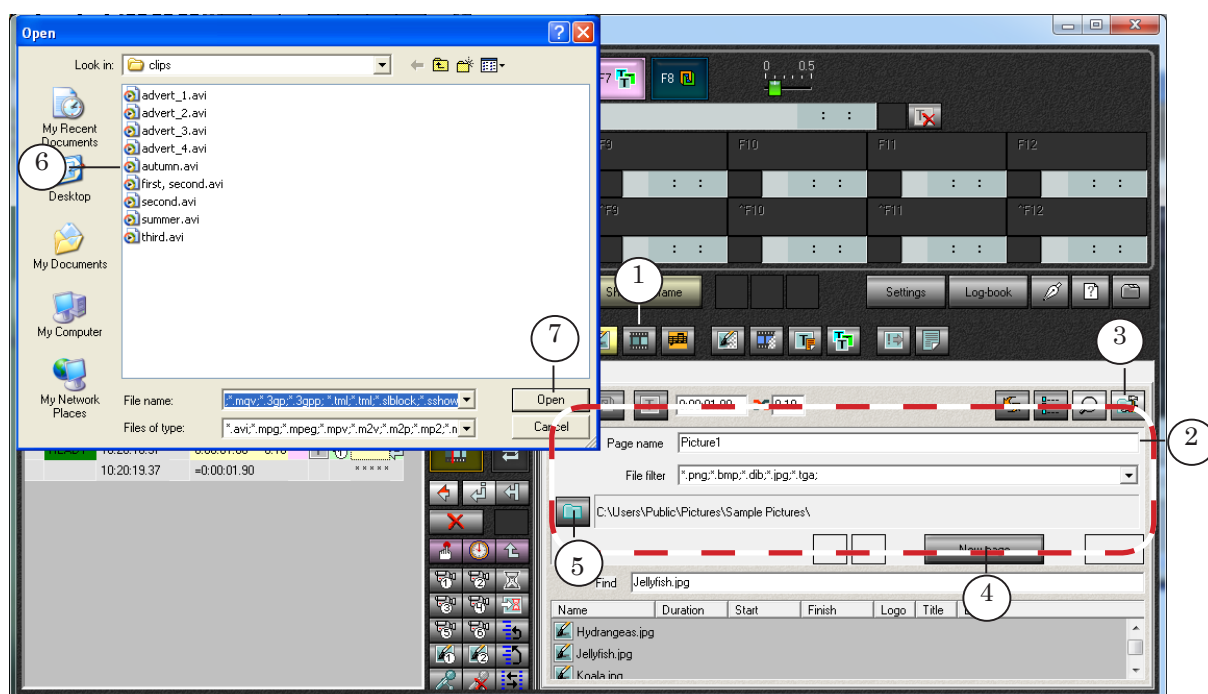
For more information on working with the FDOAir application, see the [«FDOAir. Broadcast Automation. Basic User's Guide»](#) and [«FDOAir. Additional Sections. User's Guide»](#).



## Step 2. Customizing of File Pages

Customize file pages with clips list in the main application window to add clips from hard disk to schedule:

1. Click the Movies button (1) to pass to file pages.
2. If pages' group of elements is hidden click Customize (3) to make it visible.
3. There is at least one file page in the Movies group. If you want to add some more pages click New page (4).
4. Specify path to folder with clips by clicking the Set folder button (5) and select in the appeared window necessary folder and file in it (6). Then click Open (7).
5. List of files from specified folder is displayed on selected file page.



## Step 3. Creation of Schedule

Create a schedule with 2 types of blocks to insert your content in passthrough signal automatically:

1. For translation of a signal from the main broadcasting station. Such blocks contain commands to control passthrough video from board inputs:  
VideoInput N, N is index from 1 to 6.
2. For translation of a content from local station. If your content is in the form of files located on hard disk blocks will contain commands for broadcasting of video from files (Show clip).





## Step 4. Control Over Broadcasting

Use created schedule to deal with automatized control over broadcasting process and specific buttons in the main application window for interactive control.

1. To start schedule:
  1. Be sure that indicator of executable string (1) is in right line and in needed schedule table.
  - If you need to place indicator in necessary line double-click this line in the first column.
  2. Then click Start (2).
2. To control switching of a passthrough video in real-time mode use either the buttons from the main application window (F3–F5, ^F3–^F5 (3)) or corresponding hot keys (F3–F5, Ctrl+F3–Ctrl+F5).



3. To switch default pictures on operatively use the F1, F2 buttons (4) or corresponding hot keys.





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## Useful Links

### **Forward T Product Line: Description, Software Delivery, Documentation, Ready Solutions**

<http://softlab.tv/index.html>

### **Support**

e-mail: [forward@softlab.tv](mailto:forward@softlab.tv)

[forward@sl.iae.nsk.su](mailto:forward@sl.iae.nsk.su)

[forward@softlab-nsk.com](mailto:forward@softlab-nsk.com)

### **Forum**

<http://www.softlab-nsk.com/forum> (currently available in Russian only)

### **Documentation for Additional Information:**

1. [Forward T Software Setup. User's Guide](#)
2. [FDOnAir. Broadcast Automation. Basic User's Guide](#)
3. [FDOnAir. Additional Sections. User's Guide](#)
4. [FDOnAir Commands List – Broadcast Automation. User's Guide](#)
5. [Forward WatchDog Box. Monitoring Hardware-Software Systems Based on the FD300 Board. Setup Guide](#)
6. [FDConfig2. Application for Customizing of FDExt Set of Boards Parameters. User's Guide](#)

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